

Corporal Josue Barron lost his left leg and left eye in an improvised explosive device blast Oct. 21, 2010. But he will never forget where he came from or who he is: a member of 3rd Battalion, 5th Marine Regiment ... the Darkhorse Battalion. It is this pride that drives him to excel as he competes against other Wounded Warriors in the 2012 Marine Corps Trials. (Photo by Sergeant Mark Fayloga)



# Wounded, Ill, and Injured Project FY2013 Annual Report

Public Health Support for Our Nation's Warriors



**NAVY AND MARINE CORPS PUBLIC HEALTH CENTER**  
PREVENTION AND PROTECTION START HERE



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### **Wounded, Ill, and Injured Project FY2013 Annual Report**

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Published: March 31, 2014



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## Message from the Commanding Officer



**Captain Michael J. Macinski**

"The Navy and Marine Corps Public Health Center's commitment to serving our Sailors, Marines, and their families remains as enduring as their commitment and sacrifice in support of our nation's freedom."

During the past 10 years of armed conflict, the military's emphasis on the three pillars of Force Health Protection (FHP) – Healthy and Fit Force, Prevention and Protection, and Medical and Rehabilitative Care – resulted in the lowest rates of non-combat injuries in history and proved to be essential components of warfighter effectiveness. Despite these impressive results, service members are still returning from war with complicated burdens of physical and mental injuries. Traumatic brain injury, post-traumatic stress disorder, substance abuse issues, traumatic limb amputations, and an alarming rate of suicidal behavior pose vastly different public health challenges than those seen in past conflicts. The Navy and Marine Corps Public Health Center (NMCPHC) has adapted and evolved throughout its 50-year Naval and public health history to undertake these challenges as well as support the 21st Century Sailor and Marine Initiative. Because of this, Navy Medicine turned to us for support in addressing the unique needs of these wounded, ill, and injured (WII) Sailors and Marines, and their families.

NMCPHC embodies Navy Medicine's commitment to the WII population. We enhance the readiness, effectiveness, and resilience of fighting forces worldwide through evidence-based population health strategies and services. NMCPHC products and services enable data-driven outcomes for WII service members by blending surveillance, health analytics, and health promotion. We develop early intervention, detection, prevention, recovery, and resiliency programs for Sailors and Marines dealing with the effects of war – focusing our efforts on physical, behavioral, and psychological health threats. We collaborate with a variety of health professionals to deliver effective, world-class products for healthcare providers, military health professionals, and WII service members and their loved ones.

I proudly present our *NMCPHC WII Project FY2013 Annual Report* that delineates the accomplishments and benefits of our WII products and services. Building on early program success and experience, NMCPHC enhanced existing projects and developed new ones in fiscal year 2013. Some of our most notable successes this year included:

- ▶ Developed and utilized metrics to evaluate the effectiveness of WII projects throughout Navy Medicine to contribute to health process improvements for wounded service members.
- ▶ Served as subject matter experts and delivered detailed clinical analysis for Navy suicide case reviews at the request of the Chief of Naval Operations and Navy Surgeon General. Our efforts contributed to enhanced suicide prevention strategies.
- ▶ Expanded the Navy's Periodic Occupational and Environmental Monitoring Summary Program to include five new summaries that quantify the health risks associated with environmental stressors and exposures during deployment.
- ▶ Piloted a WII Health Risk Assessment tool designed to identify healthy and unhealthy behaviors that affect the healing, recovery, and psychological health of WII Sailors and Marines.
- ▶ Certified 197 deployable scientists and technicians as proficient and deployment-ready to conduct health hazard assessments.
- ▶ Earned a recommendation for the Navy Entomology Center of Excellence to be designated as a World Health Organization (WHO) Collaborating Centre by the scientist in charge at the WHO Pesticide Evaluation Scheme.

NMCPHC invests its distinct capabilities across the full spectrum of FHP and will continue to refine and develop data-driven strategies and methods to prevent illness, improve physical and behavioral health, reduce costs, and maximize force readiness. The resulting products provide value not only to the Navy, but to other services in the United States (U.S.) military. I remain confident that NMCPHC's commitment to serving our WII Sailors, Marines, and their families will endure alongside their commitment and sacrifice to protect our nation's freedom.

M. J. MACINSKI  
Captain, Medical Service Corps  
United States Navy  
Commanding Officer



Photo by Mass Communications Specialist 2nd Class Jason Behnke

**This report is dedicated to our nation's Sailors and Marines. NMCPHC is committed to protecting their health and enhancing their well-being.**







Photo by Sergeant Jesse J. Johnson

## Executive Summary

The Navy and Marine Corps Public Health Center (NMCPHC) provides worldwide Force Health Protection (FHP) services to ensure readiness and resilience of Sailors and Marines wherever they might be – from the deck of an amphibious assault ship, in the sands of Afghanistan, or the barracks at Camp Pendleton. NMCPHC protects the population through occupational and environmental medicine, disease surveillance and monitoring, health promotion education and training, and prevention programs. These programs support efforts throughout the Department of Defense (DOD), including the Department of the Navy's (DON) 21st Century Sailor and Marine Initiative, to monitor and analyze disease data, promote healthy living, consult on health risk issues, and shape public health in the Navy.

NMCPHC uniquely refines and targets programs and services to support specific Navy Medicine programs through the Wounded, Ill, and Injured (WII) Project and Medical Home Port (MHP). Four complementary projects provide analytical and preventive expertise in support of the WII Project:

- ▶ WII 141 Expanded Surveillance and Metrics Support
- ▶ WII 141A Health Promotion and Wellness
- ▶ WII 141B Health Hazard Assessment
- ▶ WII 141C Navy Entomology Center of Excellence

Collectively, these projects are the NMCPHC WII Program. The NMCPHC WII Program supports FHP, a unified strategy that provides integrated preventive and clinical programs designed to protect service members, by advancing three interrelated pillars: Healthy and Fit Force, Protection and Prevention, and Medical and Rehabilitative Care, as depicted in **Figure 1**. The goal of FHP is to provide a fit and healthy force, protected from disease and injury, when and where the mission requires it, while simultaneously adapting the medical forces to be more technologically advanced, smaller, and more mobile. Overall, the NMCPHC WII Program:

- ▶ Creates products and services that support readiness, decrease disease and illness, facilitate recovery, and enhance resilience.
- ▶ Designs and refines data collection methodologies that ensure the effectiveness of Navy Medicine services for WII service members.
- ▶ Delivers reports and programs that generate actionable information, products, and services to enable data-driven policies, risk mitigation decisions, and clinical care guidelines.
- ▶ Collaborates with sister Services, the Defense Health Agency (DHA), and other federal agencies to evaluate and improve the health of the WII population.



**Figure 1: NMCPHC WII Program supports the three Force Health Protection pillars**

This annual report demonstrates how FHP serves as the foundation of the command's WII Program and how the projects collectively improve public health of WII service members throughout the Navy and Marine Corps. NMCPHC's WII products and services play a significant role in achieving readiness in the Navy and Marine Corps, as indicated by key accomplishments from fiscal year (FY) 2013 highlighted in this report.

As the nation continues to defend democracy around the globe and provide humanitarian assistance in response to natural disasters, the U.S. military must be in a constant state of readiness and prepare service members both physically and psychologically to fulfill their mission. NMCPHC continues to advance FHP through collaborative and innovative programs that improve the readiness, resilience, and recovery of WII Sailors and Marines.

*"NMCPHC products and services are critical to the readiness, resilience, and recovery of WII service members. Our expert staff assist and develop solutions that directly impact Sailors and Marines and arm leadership with information to make effective and educated decisions related to healthcare. We are proud to provide Sailors, Marines, and their families with products and services that yield a lasting, positive impact on our military communities."*

- Mr. William Calvert, Deputy Director  
for Population Health at NMCPHC



Photo by Chief Hospital Corpsman Joshua Ives

## NMCPHC WII Program Description: History, Overview, and Strategic Alignment

### HISTORY

The mission of NMCPHC is to provide worldwide FHP services to Naval and Joint Forces in support of the National Military Strategy. The NMCPHC WII Program provides specialized FHP analysis and products designed to strengthen Navy Medicine's ability to promote, protect, and restore the mental and physical well-being of Sailors and Marines. NMCPHC WII efforts span the spectrum of FHP from enabling a healthy and fit force to analyzing medical and rehabilitative care.

First funded in FY2010, NMCPHC developed the WII 141 Project at the request from Navy Medicine leadership to provide a detailed assessment of the circumstances and needs of WII Sailors and Marines. Since its inception, Bureau of Medicine and Surgery (BUMED) leadership and program evaluations have identified a favorable return on investment for the project, noting a strong surveillance capability supported by staff that delivered high quality data analyses. These robust capabilities established the foundation for innovative services that will continue to produce a return on investment well into the future. As the project progresses, NMCPHC expects to reduce healthcare expenses and improve clinical results by arming Sailors and Marines with information that promotes healthy lifestyle choices, providing data analysis to influence healthcare decisions, and developing cutting-edge products to protect service members.

### Report History

This year's annual report details the breadth and depth of services provided by NMCPHC during the FY2013. The first published report, the *NMCPHC WII Project 141 Progress Report*, encompassed the accomplishments from the project's inception in 2010 to March 2012; the second report, the *NMCPHC WII Project 2012 Annual Report*, featured products and services delivered by the WII projects in calendar year (CY) 2012. Given the difference in time parameters, the FY2013 annual report includes some accomplishments reflected in the 2012 report. NMCPHC will continue to provide annual reports that include accomplishments completed within the fiscal year, highlight collaboration among the project teams and across organizations, and demonstrate key findings and impacts of each achievement.



## NMCPHC WII PROGRAM DESCRIPTION: HISTORY, OVERVIEW, AND STRATEGIC ALIGNMENT

### OVERVIEW

Four distinct WII projects embody the NMCPHC WII Program: **WII 141 Expanded Surveillance and Metrics Support**, **WII 141A Health Promotion and Wellness (HPW)**, **WII 141B Health Hazard Assessment (HHA)**, and **WII 141C Navy Entomology Center of Excellence (NECE)**. The program offers products and services targeted to providers, scientists, commanders, leadership, and individuals. Navy physicians gain valuable reports on patients throughout the care continuum from health surveillance and health hazard assessment in theater to utilization of Military Treatment Facility (MTF) services and resilience building practices. The program arms military leaders with the tools to develop and maintain a fit and deployable force, and provides operational commanders with real-time information to avoid or mitigate environmental exposures ensuring the protection of troops from health hazards that decrease readiness.

According to Rear Admiral Walter “Ted” Carter, Director of the 21st Century Sailor Office, “Resilience is not one program or initiative, but a **comprehensive effort** to build life skills that not only ensure Navy readiness, but also fully develop the personal and professional talent of our force.”

The NMCPHC WII Program uses modern data science and health analysis techniques to generate reports that drive leadership decisions and develop outreach programs that increase the readiness and resilience of service members by promoting healthy behaviors. The **Expanded Surveillance and Metrics Support Project** analyzes Navy-wide WII programs to drive effective healthcare services, reduce healthcare expenses, improve clinical results, and deliver epidemiological surveillance to prevent disease and injury. The **HPW Project** extends prevention efforts through evidence-based health promotion and wellness programs that hasten recovery and promote healthy lifestyles. Collaboration between these two projects promotes the seamless integration of sophisticated data analysis with targeted health promotion strategies to deliver innovative programs relevant to real world settings. NMCPHC’s applied analysis approach provides a dynamic and versatile capability for the Navy and Marine Corps that translate public health analysis into actionable outcomes that promote health and support force readiness.

NMCPHC’s two deployed warfighter protection projects, **HHA** and **NECE**, support the ongoing assessment of deployed health hazards and the prevention of vector-transmitted diseases. **HHA** supports deployment health by providing operational commanders timely risk assessments to control and mitigate hazardous situations. **NECE** serves as an international authority on effective ways for safeguarding human life from blood-feeding insects that carry human disease and sustaining a lasting, positive impact on warfighters and at-risk populations.



NMCPHC WII PROGRAM DESCRIPTION:  
HISTORY, OVERVIEW, AND STRATEGIC ALIGNMENT

ALIGNMENT TO FORCE HEALTH PROTECTION

The NMCPHC WII Program impacts health outcomes of service members during all phases of deployment and across the three FHP pillars, as depicted in **Figure 2**. For example, NMCPHC provides surveillance reports during **Pre-Deployment** preparations that offer insight on unit health trends and develops or recommends health promotion products to assist individuals in achieving optimal readiness. During the **Deployment** phase, NMCPHC provides HHA training for preventive medicine technicians to help identify and mitigate health hazards on the battlefield. Scientific advancements of the NECE WII staff protect service members from debilitating insect-borne illnesses.

WII 141 surveillance activities capture and analyze medical, personnel, and operational databases to assess the health and well-being of wounded personnel throughout deployment. NMCPHC supports the **Post-Deployment** and **Rehabilitation** phases through epidemiological analysis of the medical and rehabilitative care delivered in garrison. These analyses and reports outline the burden of disease and associated care and are utilized to ensure appropriate allocation of resources. As the deployment cycle is a continuous loop, the needs of the WII population are constantly re-examined and NMCPHC WII products and services are refined to reflect any changes.

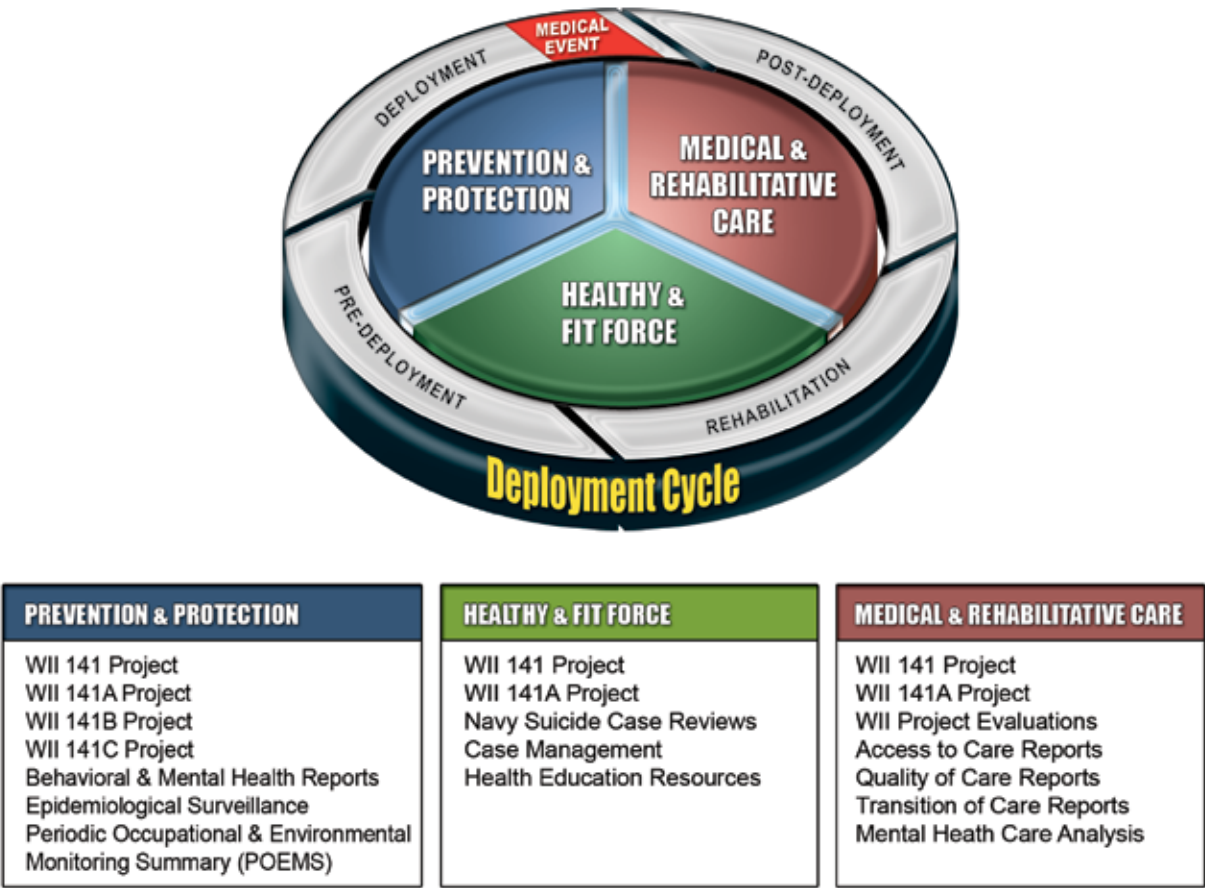
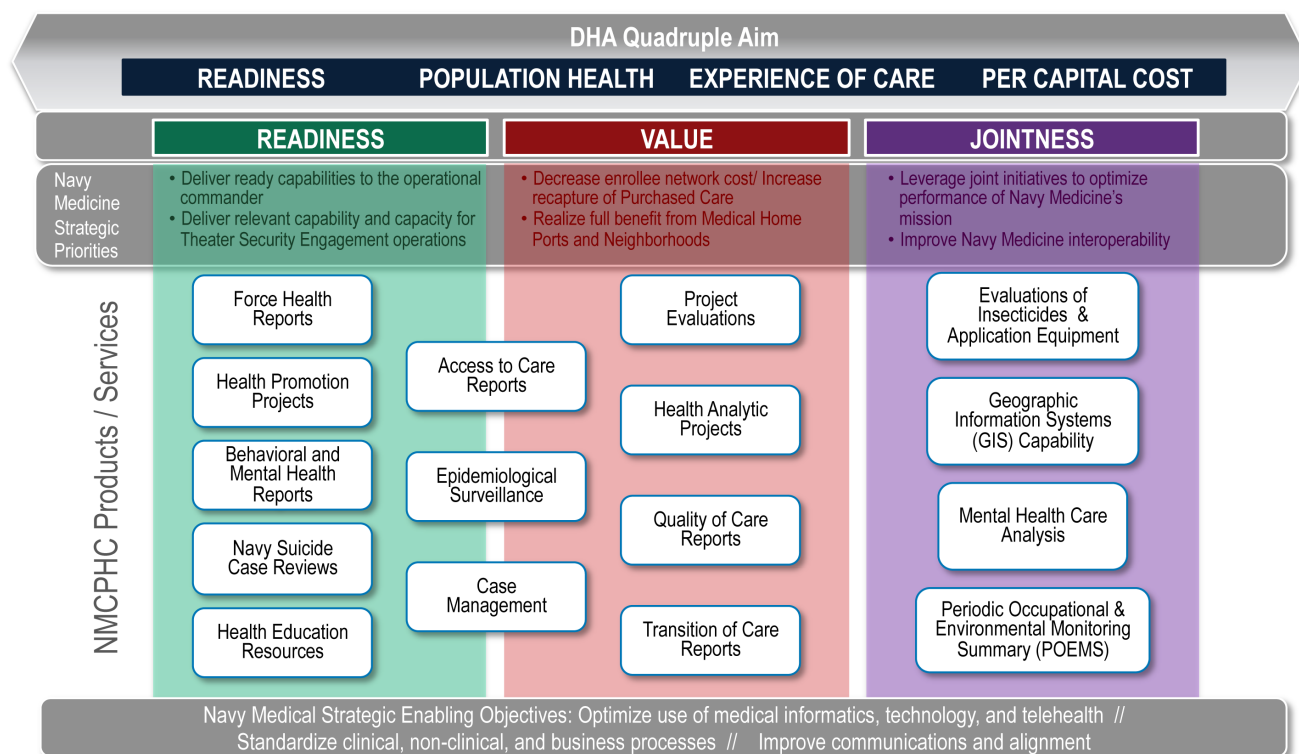


Figure 2: NMCPHC WII Products and Services Alignment to Force Health Protection

## ALIGNMENT TO DOD AND NAVY STRATEGIES

In addition to supporting the goals of FHP, the NMCPHC WII Program also aligns to the DHA's Quadruple Aim and Navy Medicine Strategic Priorities (Readiness, Value, and Jointness), as depicted in **Figure 3**. Readiness, Value, and Jointness support Navy Medicine in its mission to enable healthcare that is patient-centered and provides the best value, preserves health, and maintains readiness. DHA's Quadruple Aim strives to achieve medical readiness, improve health, enhance the experience of care, and lower healthcare costs – important efforts of the WII Program. The command's WII projects also support the National Prevention Strategy, Total Force Fitness for the 21st Century framework, and Navy-wide strategic efforts such as the 21st

Century Sailor and Marine Initiative. Each of these strategies coincides with the readiness, resilience, and wellness of Sailors and Marines – all related to the continuum of care NMCPHC strives to support. These guiding frameworks serve as a foundation for the NMCPHC WII Program to align products, services, and strategies that are relevant to today's focus and tomorrow's goals. NMCPHC also strives to influence future initiatives through the WII Program's detailed analyses and innovative solutions. The subsequent pages in this report describe in detail the purpose of each project and key accomplishments that contribute to the health and well-being of the WII population and overall support to Navy Medicine.



**Figure 3: NMCPHC WII Products and Services Alignment to DHA Quadruple Aim and Navy Medicine Strategic Priorities**





Photo by Mass Communication Specialist 2nd Class Kenneth R. Hendrix

## Healthy and Fit Force

The goal of the first FHP pillar is to ensure a healthy and fit force that is mission ready, combat resilient, and reliable. Promoting wellness and reducing preventable illness and injury are key tools in achieving this pillar. The majority of this care occurs in garrison, i.e., in home port largely delivered from fixed medical treatment facilities.

Research over the past 10 years reported strong evidence of the cost savings from health promotion programs, including integrative psychological health prevention efforts (Adams 2009, Chapman 2003, Katz and Ali 2006).

Through the **WII 141** and **WII 141A Projects**, NMCPHC offers tailored informational tools, materials, and programs to encourage healthy lifestyle choices and conducts epidemiological surveillance to provide leadership with recommendations to minimize the impact of preventable injury and disease. Specific examples of how NMCPHC contributed to rehabilitation initiatives within the WII population include:

- ▶ Developed and presented the “Road to Recovery - Healthy Living Recommendations to Incorporate into Your Recovery Plan” webinar to educate WII service members and caregivers on tobacco cessation, injury prevention, weight management, and nutrition during illness or injury.

- ▶ Created the “Life After an Amputation” webpage to provide resources on physical activity, assistive technology, nutrition, healthy living, veterans services, recreation and adaptive sports, and emotional well-being that promote a successful recovery during rehabilitation for amputees.
- ▶ Developed nine fact sheets for case managers that address the health behavior needs of WII patients based on feedback from an assessment that determined what services, tools, and educational resources would be most beneficial for those who provide case management services.

NMCPHC also addressed the psychological and emotional well-being of service members to encourage strong coping skills that will improve individual focus on mission requirements.

- ▶ Provided subject matter experts in epidemiology, clinical data analysis, and health education for Navy suicide case reviews that resulted in recommendations to policy changes and prevention practices. **Spotlight 1** describes NMCPHC’s contributions to the prevention of suicide through the **WII 141** and **WII 141A Project** experts.
- ▶ Redesigned and updated the Relax, Relax Toolkit to help Sailors and Marines who are facing stress and psychological and emotional issues. The toolkit now includes a larger, more diverse selection of music and new sections on mindfulness, sleep, relaxation techniques, and coping strategies.





### Spotlight 1. Utilizing Healthcare Data to Improve Suicide Prevention Initiatives

At the request of the Chief of Naval Operations and Navy Surgeon General, epidemiologists, clinical data analysts, and health educators from the **WII 141** and **WII 141A Projects** participated in both the Office of the Chief of Naval Operations (OPNAV) Suicide Case Review and the Navy Surgeon General's Deep Dive Suicide Case Review.

NMCPHC WII Program experts collaborated with suicide specialists, suicide prevention coordinators, and medical personnel to identify trends, gaps, and potential points of intervention to reduce suicide attempts and deaths by suicide. The team performed a thorough review of all Navy suicide deaths and used the NMCPHC's clinical data analysis to help develop recommendations for prevention efforts. The case reviews were vital in the identification of risk factors, potential areas of intervention, and access to care concerns.

The collaborative report from the deep dive review was presented to the Navy Surgeon General with recommendations for how Navy Medicine can promote psychological and emotional well-being and reduce suicides. A DON working group used this information to develop the Vice Chief of Naval Operations' *Task Force Resilient Final Report*. The *Task Force Resilient Final Report*, in turn, influenced Navy strategy and resulted in the establishment of the 21st Century Sailor Office to address and manage resilience promotion, behavioral health, suicide prevention, and wellness strategy. NMCPHC also contributed to a special Navy report, *Attempted Suicides and Deaths: 2011-2012*, to improve knowledge of suicide trends among Sailors and aid in identification of treatment methods and intervention programs.

The WII Program provided several advanced analyses of electronic health data and health conditions impacting the WII population which have cost savings potential for Navy Medicine. NMCPHC epidemiologists and programmers provided near real-time reporting on health concerns affecting WII service members, including behavioral health and amputations, to identify injuries and illness impacting mission readiness. Key examples of **WII 141** and **WII 141A** health assessment activities include:

- Developed and tested a Health Risk Assessment (HRA) tool tailored to the specific health concerns of WII service members such as prescription drug use, pain, intimacy, and the use of complementary and alternative medicine. The tool identifies healthy and unhealthy behaviors that may affect healing, recovery, psychological health, and overall resilience to improve awareness of these issues between healthcare providers and service members. The only tool of its kind, the WII HRA will provide a baseline of data for health educators to plan and implement community interventions.

- Provided quarterly incidence reports detailing the prevalence rates of alcohol and substance abuse among Navy and Marine Corps service members for the Vice Chief of Naval Operations and BUMED M9 to target strategies for reducing substance abuse.

**A Healthy and Fit Force is  
mission ready, combat resilient,  
and reliable.**



Photo by Mass Communications Specialist 3rd Class Michael Feddersen

## Prevention and Protection

Prevention and protection is the second FHP pillar and addresses two types of threats for deployed troops: disease and non-battle injury (DNBI) and enemy or terrorist threats. The NMCPHC WII Program addresses both threats by identifying potential health risks, developing courses of action, and advising commanders of risks and threat countermeasures. WII prevention and protection activities such as health and environmental surveillance, health hazard assessments, and vector control provided through the **WII 141, WII 141A, WII 141B, and WII 141C Projects** are essential to sustaining the health of the force as well as improving the recovery of the WII population.

DNBIs demonstrate the greatest threat to readiness and are responsible for more morbidity than illness or injury deliberately inflicted by the enemy. NMCPHC WII surveillance and health promotion projects helped reduce this DNBI burden by providing commanders analysis and metrics to support prevention efforts and maintain safe and healthy working environments for their troops. In FY2013, NMCPHC:

- ▶ Provided quarterly metric analysis of deployment limiting conditions, such as behavioral health conditions and orthopedic injuries in shipboard Navy service members to improve clinical practices, resource allocation, and support policies to implement evidence-based practices. The analysis informs key customers within the Agile Capabilities Working Group of conditions reducing mission readiness among shipboard service members

and supports program development and readiness analysis of Naval Forces.

- ▶ Conducted analysis of foot and ankle crush injuries among Marine Corps combat engineers at Camp Lejeune from 2011 to 2012 to evaluate the impact of these injuries and influence injury prevention efforts.
- ▶ Identified patients with genital injuries to confirm case findings and burden in the Marine Corps in response to a request from the Wounded Warrior Regiment. These types of tailored reports allow providers to identify and follow up with patients to assure they receive proper care for the entire treatment period, achieve recovery, and return to work.

NMCPHC experts use epidemiological surveillance to track disease and injury incidence in the Navy and Marine Corps population. Effective epidemiological surveillance prevents illness and injury through early detection and combines healthcare data with personnel, environmental, and operations data. The Force and Fleet health surveillance reports assist in identifying behavioral health outcomes, including Post-Traumatic Stress Disorder (PTSD), Traumatic Brain Injury (TBI), Major Depressive Disorder (MDD), and Substance Use Disorder (SUD). The surveillance reports allowed medical staff to respond at the unit level and enabled data-driven corrective actions. Resulting analyses also enable effective resource allocation to target unique units. Specific NMCPHC health surveillance analysis products include:

- ▶ TBI and Mild Traumatic Brain Injury (mTBI) Incidence Reports for BUMED to identify changing trends and build policies based on analysis of TBI incidence in the Navy and Marine Corps. The project also provided yearly incidence and prevalence trends of TBI among active duty Navy and Marine Corps service members and information on severity, follow-up care, and demographics of the patient population. This information identified MTFs that require resources to care for WII service members and allowed Navy Medicine to compare and assess TBI programs and care across the enterprise.
- ▶ The Navy Expeditionary Combat Command (NECC) WII Registry that identified NECC service members diagnosed with injuries and behavioral health conditions. The information influenced specific prevention strategies that minimize the impact of preventable injury and disease and improve military health readiness.
- ▶ Unit-specific Force Health Surveillance Report for the Civil Engineering Corps detailing monthly trends of behavioral health encounters, TBI, positive behavioral health screens on the Post-Deployment Health Reassessment (PDHRA), and extended use of prescription medications in CY2012 to evaluate population health and assess trends.
- ▶ Identification of antibiotic resistant infections in the WII population for use by infection control practitioners at military treatment facilities to support efforts to improve care.

NMCPHC also analyzes occupational and environmental health surveillance to advise leadership of potential health risks encountered during deployments, including biological and chemical terrorist threats. Health hazard assessments such as Periodic Occupational and Environmental Monitoring Summaries (POEMS) assess health risks for populations deployed to specific sites and can be used to provide reliable assessments of deployment-related environmental exposures. Military providers use this information to care for the WII population; this information is also critical for care when WII service members transition to the Department of Veterans Affairs. NMCPHC experts train personnel in field preventive medicine techniques and calibrate equipment to provide operational commanders timely risk assessments to guide, control, and mitigate deployment hazards in theater. NMCPHC also develops products and services to protect service members against environmental hazards, blood-feeding insects that carry human disease, and occupational stressors. Products and services include:

- ▶ POEMS to evaluate the health risks associated with chemical, biological, and physical stressors faced by deployed warriors

developed for Camp Lemonnier, Camp Fallujah, Al Asad Air Base, Camp Leatherneck-Bastion, and Camp Dwyer. POEMS assessed the significance of both short-term and long-term health risks for populations deployed to specific sites and improved population health surveillance. POEMS can be used to provide defensible, definitive assessments of deployment-related environmental exposures to medical practitioners, service members, stakeholders, and other services in the U.S. military.

- ▶ Calibration of field-portable analytical equipment which helped identify, eliminate, and document personnel exposures to environmental health stressors in the deployed environment.
- ▶ Quarterly execution of proficiency analytical testing (PAT) of healthcare scientists which confirmed proficiency in identification, assessment, and control of personnel exposures to environmental health stressors in the expeditionary environment. The PAT training ensures Forward Deployable Preventive Medicine Units (FDPMPUs) are capable to deploy modern field-portable analytical equipment proficiently in different areas.
- ▶ Development of a multi-functional, lightweight, durable, compressed air backpack sprayer that addressed a capability shortfall for applying residual insecticides to a variety of surfaces. Recommended by the Armed Forces Pest Management Board's (AFPMB) Equipment Committee and approved by the AFPMB Council, the Dorendorf JQX sprayer received a National Stock Number (NSN) and is now listed on the approved equipment list and in use by the Navy's FDPMPUs.
- ▶ Patented innovative method for producing long-lasting insecticide-treated bed nets to combat the spread of malaria in Africa and Asia, improving the product durability from about 8 months to at least 2 years before needing replacement. These types of innovations led to recognition from the World Health Organization (WHO) as detailed in **Spotlight 2**. In addition, royalties from the net sales will provide a substantial source of funding for the Navy, conservatively estimated to be between \$1 million and \$1.8 million each year.

**Protection and Prevention is essential to sustaining the health of the force and improving the recovery of the WII population.**



### Spotlight 2. Becoming an International Leader: NECE recommended for World Health Organization Collaborating Centre Designation

The scientist in charge at the WHO Pesticide Evaluation Scheme visited NECE to evaluate the Center's equipment testing and evaluation capabilities after receiving a referral from a NECE partner. As a result of this visit, NECE was recommended to become a WHO Collaborating Centre (WHO CC) for testing insecticide application equipment, **the only DOD center to be recognized as such**. As a WHO CC, NECE will:

- ▶ Serve as an international center of excellence for public health insecticide application methods.
- ▶ Recruit more collaborative research efforts from national and international federal laboratories, universities, and industries resulting in new and improved products to protect deployed warfighters from insects that transmit diseases.
- ▶ Engage in joint initiatives that help promote global health thus supporting a key national security priority for the DOD and Navy.
- ▶ Receive reimbursable funding from the WHO to test and evaluate insect control products for industry organizations that seek to market goods in developing countries with WHO approval.
- ▶ Receive reimbursable travel funding on behalf of the WHO for subject matter experts to provide training in developing countries for public health and preventive medicine personnel.



Chief Hospital Corpsman Emeterio Donato, chief of the preventive medicine team for Camp Lemonnier's expeditionary medical facility, tests the pH of the drinking water on Camp Lemonnier, Djibouti. The team conducts monthly quality control testing in conjunction with daily testing by the camp's water production plant to ensure the safety of the drinking water. (Photo by Mass Communication Specialist 1st Class Eric Dietrich)







Photo by Mass Communications Specialist 2nd Class Greg Mitchell

## Medical and Rehabilitative Care

The third pillar of FHP, Medical and Rehabilitative Care, describes the continuum of care for the WII population from the battlefield first responder, through in-theater resuscitation and hospitalization, to definitive care and rehabilitation in the contiguous United States. BUMED charged NMCPHC to assess wounded warrior care across the Navy Medicine enterprise, determine the impact on resources, and evaluate the effectiveness of clinical processes for recent signature wounds (i.e., TBI, PTSD, behavioral health, substance abuse, and amputations) and other conditions impacting WII service members. In response, NMCPHC initiated the **WII 141 Project**.

NMCPHC evaluated the study methodology and clinical health outcomes for multiple WII projects to describe the effectiveness and cost efficiency of programs that address WII health concerns. The command provided subject matter expertise in developing project outcome metrics, assisting 11 other WII projects in implementing and reporting quarterly metrics. NMCPHC also produced quarterly statistical analyses and data visualization reports detailing outcomes and trends in access to care (ATC), quality of care (QOC), and transition of care (TOC). These reports validated the need to improve case management documentation and were instrumental in revising resource and case management policies to improve the WII continuum of care from active duty to veteran status. Analyses included:

- ▶ ATC Quarterly Reports analyzed trends on access to mental healthcare for the WII population. Developed clinical care efficiency metrics on wait times in deployment health clinics.
- ▶ QOC Quarterly Reports analyzed trends on known high volume, high risk, and high cost conditions affecting the WII population—including TBI, PTSD, MDD, and SUD.
- ▶ TOC Quarterly Reports provided descriptive analysis of case management issues and the demand for medical services among Navy Medicine beneficiaries.

The **WII 141 Project** experts produced analytic reports of behavioral and mental health outcomes—including PTSD, MDD, mTBI, and SUD—for multiple WII stakeholders. NMCPHC also analyzed mental healthcare demands across the WII population to address inquiries from Navy and Marine Corps leaders and U.S. Congress. These reports described the effectiveness of, and demand for, behavioral health services to support programs that improve access to patient-centered care. The reports which addressed underserved WII populations in addition to broader beneficiaries of the DHA included:

- ▶ Behavioral Health Integration Program-Medical Home Port (BHIP) program evaluation providing support through metric design, data collection, and statistical analysis.

## MEDICAL AND REHABILITATIVE CARE

- ▶ Comprehensive network referral reports for mental health purchased care in fiscal years 2008-2012.
- ▶ Navy Hospital Beaufort's Re-Engineering Systems of Primary Care Treatment in the Military (RESPECT-Mil) Program Evaluation Plan to review program effectiveness, including program evaluation assistance and participant demographics for BUMED.
- ▶ Post-Deployment Medical Utilization Assessment of a Guantanamo Bay (GTMO) Guard unit to determine if heightened stress levels among Reserve Guard members resulted in increased use of clinical resources. The report helped justify the need for additional stress management training for the Reservists.

NMCPHC identified patient encounters within the amputee population associated with comorbidity to include MDD, TBI, PTSD, stress, nutrition deficiency, tobacco use, and SUD. The analysis showed trends of increased care for behavioral health, along with referrals for nutrition counseling and tobacco use, for patients with traumatic amputations. The report, *Health Promotion and Wellness Resources to Assist Wounded, Ill, and Injured Sailors and Marines with Traumatic Amputations*, emphasized the health promotion resources developed to prevent, mitigate, and reduce these conditions during the early phases of treatment and rehabilitation of WII members.

At BUMED M3's request, NMCPHC determined the prevalence of chronic pain across the Navy and Marine Corps population, detailed in **Spotlight 3**, to understand factors that contribute to this health issue. NMCPHC reports also resulted in initiatives to reduce Emergency Department (ED) direct and purchased care costs at Navy MTFs within Navy Medicine East, including:

- ▶ ED Utilization Analysis that supported the Medical Home Port champions at Naval Hospital (NH) Camp Lejeune, NH Jacksonville, Naval Medical Center (NMC) Portsmouth, and NH Pensacola in identifying ED high utilizers. This analysis has the capability to support the transition to DHA, providing the same robust analysis for all services.
- ▶ At the request of the U.S. Fleet Forces Command (USFF) Surgeon, NMCPHC conducted an ED utilization analysis to measure use of direct and purchased care emergency departments by active duty Sailors assigned to operational forces in the Tidewater region. The report assists USFF leadership in understanding ED utilization trends and access to care issues among operational forces.

These reports enabled operational commanders and healthcare providers to make informed decisions on policies and practices to treat and prevent deployment-related illnesses and injuries. As the draw-down of combat forces continues, NMCPHC's evaluation of medical and rehabilitative care programs becomes increasingly relevant as the command continues to support the WII population.

### Spotlight 3. Understanding the Impact of Chronic Pain in the Navy

The prevalence of chronic pain in the U.S. military is unclear. However, there is increasing recognition that chronic pain is a multifaceted disorder with considerable disability for the patient and a burden to military readiness and the healthcare system. BUMED M3 requested NMCPHC conduct an analysis on the prevalence of non-cancer chronic pain across the Navy and Marine Corps population for FY2012. The analysis helped leadership thoroughly understand the nature of chronic pain, its prevalence, and predisposing factors. The resulting report developed by the Health Analysis Department exceeded expectations and was commended by BUMED M3 as being "exceptionally impressive." Navy Medicine plans to use this information to provide the most effective mitigation and management strategies with the goal of reducing the overall burden of pain among beneficiaries and reducing healthcare costs.



**Medical and Rehabilitative Care –**  
comprehensive medical support to  
WII service members anywhere in  
the world.



Photo by Mass Communications Specialist 3rd Class Scott Pittman

## NMCPHC WII Program Products and Services

The products and services provided by the NMCPHC WII Program are critical in addressing the healthcare needs of WII Sailors and Marines. These programs enhance all three pillars of FHP and promote healthy lifestyle choices, protect against environmental health hazards, improve clinical results, and reduce healthcare expenses. The following sections showcase the products and services of each WII project along with the associated outcomes and impacts that align to the FHP pillars and public health focus areas.

*"We are excited and proud to see NMCPHC products and services directly impacting Sailors, Marines, and their families. Making a difference in the lives of our warfighters and arming leadership with information they need to make effective and informed decisions related to healthcare is a task we are proud to uphold."*

– Commander Amy Drayton, Director of Population Health at NMCPHC

## WII 141 Project: Expanded Surveillance and Metrics Support

Clinical health analysis and epidemiological surveillance are essential for improving and sustaining the efficacy of Navy healthcare. The WII 141 Project, supported by the Health Analysis (HA) and EpiData Center (EDC) Departments, provides leadership with accurate and timely health informatics and public health surveillance to support strategic decisions on military healthcare policies and programs. Some of these policies and programs included the RESPECT-Mil Program, the U.S. Navy and Marine Corps Reserves Psychological Health Outreach Program, the Naval Special Warfare Program, and the TBI Treatment and Cognitive Rehabilitation Program. In FY2013, the experts within the WII 141 Project applied their knowledge and best practices to several key medical areas including TBI care, suicide prevention, and behavioral and psychological healthcare that shaped crucial decisions on healthcare policies, interventions, and programs.



## WII 141 PROJECT: EXPANDED SURVEILLANCE AND METRICS SUPPORT HEALTH ANALYSIS

### HEALTH ANALYSIS

The HA Department promotes force readiness and improves healthcare for WII Sailors and Marines by analyzing areas for cost efficiency, reducing process variation in clinical practices, and ensuring the development and implementation of quality healthcare services. In FY2013, HA received positive recognition

from service and government agencies, including from the Chief Medical Officer at TRICARE Management Activity (TMA), for the products and services listed in the following tables.

Focus Area <i>Pillar</i>	Key Product	Returns/Outcomes
Suicide  <i>Healthy and Fit Force</i>	<b>OPNAV N171 Suicide Case Review</b> Conducted an annual suicide case review and provided analytical support for OPNAV N171 for suicide data analysis; requested by BUMED.	Provided analytic support for Navy suicide studies that directly informed healthcare leaders and policy makers on program effectiveness and potential interventions to prevent suicide.
	<b>Navy Surgeon General Suicide Case Review</b> Reviewed suicide cases from January 2011 to October 2012 in collaboration with EDC, HPW, and others to identify patterns, evaluate existing programs, determine potential intervention points, and assess data quality.	
Behavioral and Mental Health  <i>Healthy and Fit Force</i>  <i>Medical and Rehabilitative Care</i>	<b>Behavioral Health Integration Program - Medical Home Port Evaluation</b> Executed program evaluation to support BUMED BHIP through metric design, data collection, and statistical analysis.	Completed analytic reports on mental healthcare demands across the WII population to address inquiries from U.S. Congress and Navy and Marine Corps leadership. Evaluated the effectiveness of and demand for behavioral health services to support programs focused on improving ATC through the establishment of patient-centered care. Addressed underserved WII populations in addition to broader beneficiaries of the DHA.
	<b>Baseline Needs Assessment/Data Collection Template</b> Performed baseline analysis with the NMC Portsmouth Psychology Clinic to plan a restructuring of mental healthcare delivery by implementing an empirically-supported program of treatment. Information allowed the clinic to standardize appointment scheduling and program evaluation.	
	<b>Network Referral Reports</b> Completed three unique reports focusing on network referrals of patients with a mental health diagnosis to network purchased care for FY2008-2012. The reports focused on Marines within the network, referrals to purchased care facilities from mental health clinics, and PTSD, anxiety, and depression referrals to purchased care facilities.	
	<b>Program Evaluation Plan for BUMED M9/NH Beaufort's RESPECT-Mil Program</b> Developed a report on the RESPECT-Mil program's effectiveness, including program evaluation assistance and participant demographics.	
	<b>Post-Deployment Medical Utilization Assessment</b> Conducted an assessment for select members of a shipboard GTMO Guard and Central Command unit, to determine if increased use of clinical resources resulted from stress levels observed in reserve GTMO guard unit. The report helped justify the need for additional training for the Reservists.	
	<b>Mental Health Utilization for Children with Deployed Parents</b> Provided a report on behavioral healthcare utilization and trends in mental health diagnoses among children of active duty Sailors and Marines in relation to the parental deployment history; the report guides resource allocation and program planning for the BUMED M9 Family Programs Division.	



WII 141 PROJECT: EXPANDED SURVEILLANCE AND METRICS SUPPORT  
HEALTH ANALYSIS

Focus Area <i>Pillar</i>	Key Product	Returns/Outcomes
<b>Domain Metrics Assessments</b>  <i>Medical and Rehabilitative Care</i>	<b>ATC Quarterly Reports</b> Provided reports with analysis and trending results on mental healthcare access and clinical care efficiency metrics for the WII population.	Created extensive statistical analyses and data visualization reports detailing outcomes and trends in ATC, QOC, and TOC. Provided BUMED insight into network costs, staff efficiency in meeting demand for services, trends in mental health conditions, and beneficiary categories that drive the demand for services to improve the WII continuum of care from active duty to veteran status. Demonstrated case management documentation needs improvement across Navy Medicine.
	<b>QOC Quarterly Reports</b> Provided reports with analysis and trending results on known high volume, high risk, and high cost conditions affecting WII Sailors and Marines— including mTBI, PTSD, MDD, and SUD.	
	<b>TOC Quarterly Reports</b> Provided reports to determine pertinent information on case management issues and describe the level of multidisciplinary care and demand for services among Navy Medicine beneficiaries to ensure appropriate resource allocation.	
	<b>Case Management Reports</b> Provided reports on case management coding compliance as needed to BUMED M9 to support quality improvement efforts. Disseminated to all regions, MTFs, and business operations staff to raise awareness across Navy Medicine on compliance issues and delivered training examples used during site visits to educate MTFs on proper case management documentation. Improved documentation of case workload supports evidence-based decision making related to funding and resourcing.	
	<b>Wait Times in Deployment Health Clinics Assessment</b> Conducted a program evaluation to examine the effect of personnel expansion in deployment health clinics on wait times and the number of visits over time; the evaluation was used to assess the impact of WII funding for clinicians across the enterprise.	
<b>BUMED M9 Appointed WII Project Evaluations</b>  <i>Medical and Rehabilitative Care</i>	Navy Medicine Hearing Conservation Program (WII Project #W139)	Provided study methodology and clinical health outcomes expertise to assist with quarterly reporting and analysis for WII projects under the ATC and QOC domains. Consultations improved data quality and collection practices across all projects and the ability of Navy Medicine to assess project success and return on investment.
	Comprehensive Aesthetic Restorative Effort (CARE) (WII Project #163)	
	CARE-NMC Portsmouth (WII Project #163A)	
	Orofacial Pain Position (WII Project #W166)	
	Navy Medicine's Reintegration and Education Program (WII Project #W184)	
	Wounded Warrior Psychological Health Recovery (WII Project #W186)	
	Naval Health Clinic New England TBI Program (WII Project #W190)	
	NMC San Diego Medical and Surgical Simulation (WII Project #W207)	
	NH Jacksonville Wounded Warrior Mental Health Rehabilitation Program (WII Project #223)	

WII 141 PROJECT: EXPANDED SURVEILLANCE AND METRICS SUPPORT  
HEALTH ANALYSIS

Focus Area <i>Pillar</i>	Key Product	Returns/Outcomes
<b>BUMED M9 Appointed WII Project Evaluations</b>  <i>Medical and Rehabilitative Care (continued)</i>	Physical and Occupational Therapy Department Needs for Wounded Care (WII Project #W223)	Provided study methodology and clinical health outcomes expertise to assist with quarterly reporting and analysis for WII projects under the ATC and QOC domains. Consultations improved data quality and collection practices across all projects and the ability of Navy Medicine to assess project success and return on investment.
	Prosthetics for Navy Medicine West (WII Project #W225)	
	Functional Recovery Program for PTSD and TBI in NH Jacksonville (WII Project #226)	
	NH Jacksonville Wounded Warrior Rehabilitation Program (WII Project #W230)	
	Deputy Officer in Charge, Operational Forces Medical Liaison (WII Project #W231)	
<b>TBI Assessment and Metrics Development</b>  <i>Protection and Prevention</i>	<b>TBI Data Collection Tool</b> Developed a standardized data collection process to provide a global view of program effectiveness.	Conducted data analyses and completed reports on TBI and mTBI prevalence and related healthcare needs to identify MTFs that require resources to care for WII service members. Standardized metrics to allow Navy Medicine to compare and assess TBI programs and care across the enterprise.
	<b>mTBI Needs Assessments</b> Conducted three assessments on the mTBI burden at Navy MTFs, directly supporting enterprise-wide TBI program planning.	
	<b>TBI Site Validations</b> Provided a report on the number of active duty, guard, and reserve hospitalizations for TBI in direct and purchased care from 2012 to present, in preparation for TBI Site Validations for NMC Portsmouth, NMC San Diego, and NH Camp Lejeune. Data allows BUMED M96 to determine if correct category ratings are assigned to each MTF.	
<b>SUD and Tobacco Cessation</b>  <i>Healthy and Fit Force</i>	<b>National Defense Authorization Act (NDAA) Analysis</b> Executed a 1-day turnaround assessment for the Office of the Chief Medical Officer at TMA regarding compliance with the NDAA of 2010 to facilitate continued funding under future NDAA's.	Conducted data analysis and implemented metrics to assess and reduce substance abuse and tobacco use rates – two health behaviors that directly impede recovery among WII service members. Incorporated tobacco cessation metrics into the Population Health Navigator Dashboard for customers across Navy Medicine to view and assess MTF performance.
	<b>Tobacco Cessation Metrics</b> Analyzed three tobacco cessation metrics developed by HA to improve the validity and reliability of Navy Medicine tobacco use data collection and fidelity. Developed metrics based on clinical practice guidelines for treating tobacco use and dependence that aim to standardize Navy Medicine's diagnosis process and documentation in patient records. BUMED M3 uses the information in MHP briefs to help MTFs manage evidence-based recommendations related to tobacco use.	

WII 141 PROJECT: EXPANDED SURVEILLANCE AND METRICS SUPPORT  
HEALTH ANALYSIS

Focus Area <i>Pillar</i>	Key Product	Returns/Outcomes
Emergency Department	<b>ED High Utilizer Analysis</b> Conducted an analysis to support the MHP champions at NH Camp Lejeune, NH Jacksonville, NMC Portsmouth, and NH Pensacola in identifying ED high utilizers.	Influenced initiatives to reduce ED expenses at Navy MTFs within Navy Medicine East. In addition to reducing the number of unnecessary ED visits, data provided allows facilities to improve ATC and QOC by directing non-emergent cases to other military medical resources.
Medical and Rehabilitative Care	<b>ED Utilization Analysis Expansion</b> Expanded the ED utilization analysis to include the forces afloat in the Tidewater region for FY2012 at the request of the U.S. Fleet Forces Command Surgeon. Report compared number of visits, location of services, and chief complaint diagnoses among operation and non-operation forces to measure use of purchased care emergency and urgent care sites.	
Patient and Provider Outreach	<b>Antibiotic Utilization for Viral Respiratory Illness, DOD beneficiaries, CY2011-2012 Communications Products</b> Developed outreach materials to reduce unnecessary prescriptions that result in a potentially avoidable loss of over \$5.1 million (\$895,565 attributed to the Navy). HA report found that twenty-five percent of the time, an antibiotic was prescribed unnecessarily for a viral respiratory illness.	Enabled Sailors, Marines, and their families to use information and resources to engage in healthcare conversations and manage their own health risks, positively affecting the quality of life and the care delivered in MTFs.
Protection and Prevention		
Sleep Health	<b>Active Duty Sleep Disorders</b> Conducted an analysis of sleep disorders and associated comorbidities in collaboration with HPW to provide evidence for the development of health promotion materials. Report developed by HPW distributed to 784 medical professionals to raise awareness on how to address sleep disturbances.	Created data analysis report on sleep disorders and comorbidities for HPW to promote healthy sleep habits – an important factor that supports mental health and wound healing among the WII population.
Healthy and Fit Force		

## WII 141 PROJECT: EXPANDED SURVEILLANCE AND METRICS SUPPORT EPIDATA CENTER

### EPIDATA CENTER

EDC epidemiologists and information technology experts design analytic tools and conduct population health surveillance to improve military readiness through disease and injury prevention programs. These experts provide near real-time reporting on outcomes from deployment-related exposures and health trends affecting WII service members including mental health disorders, amputations, and suicide ideation. In FY2013, EDC expanded its data capabilities by utilizing Geographic Information Systems (GIS), a capability

across both EDC and HA, and new data sources in disease surveillance including the Theatre Medical Data Store. EDC collaborated with other military organizations by offering analytics and epidemiological consultation, as demonstrated during the 2012 Navy Surgeon General Suicide Case Reviews. EDC addressed additional needs of key WII stakeholders through the products and services contained in the following tables.

Focus Area <i>Pillar</i>	Key Product	Returns/Outcomes
<b>Ongoing Surveillance</b>  <i>Protection and Prevention</i>	<b>Annual Injury Reports for U.S. Navy and Marine Corps</b> Provided reports using medical encounter records at MTFs to assess the number of injuries reported each year and the injury rates in subordinate commands. Injury prevalence rates improve BUMED's ability to effectively and efficiently allocate resources.	Generated reoccurring reports on WII-related illnesses and injuries to provide current epidemiological surveillance. Identified injuries and illness having the greatest effect on service members to influence specific prevention strategies that minimize the impact of preventable injury and disease and improve military health readiness.
	<b>Integrated Disability Evaluation System (IDES) Monthly Report</b> Conducted an analysis of Medical Evaluation Boards (MEB) and referrals from the IDES. Identified MTFs that have met the MEB stage goal of completion within 35 days and the referral goal of less than 10 days.	
	<b>Monthly and Yearly Force and Fleet Health Reports</b> Produced reports to identify the following: behavioral health outcomes including PTSD, TBI, MDD, and SUD; prevalence rates of extended psychotropic medication use; and positive self-screens of behavioral health conditions on the PDHRA. Reports were the leading source for Headquarters and Force and Fleet Surgeons to evaluate population health and assess trends. Annual report reflected data for CY2012.	
	<b>Civil Engineering Corps Force Health Surveillance Report</b> Developed a report detailing monthly trends of behavioral health encounters, TBI, positive behavioral health screens on the PDHRA, and extended use of prescription medications for CY2012.	
	<b>Monthly TBI and mTBI Incidence Reports</b> Developed data analysis and reports on TBI incidence in the Navy and Marine Corps. Updated report reflects new case definitions and TBI severity categories used by BUMED to identify changing trends and build policies.	
	<b>Navy Expeditionary Combat Command WII Registry</b> Produced monthly database registry of NECC service members diagnosed with injuries and behavioral health conditions.	
	<b>PTSD Quarterly Report</b> Analyzed PTSD incidence rate covering all new PTSD cases from 2002 through 2012. BUMED used the report to identify changing trends and support policy decisions.	
	<b>Quarterly Alcohol and Substance Abuse Incidence Report</b> Determined prevalence of alcohol and substance abuse/dependence among Navy and Marine Corps service members as requested by BUMED.	



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Focus Area <i>Pillar</i>	Key Product	Returns/Outcomes
<b>BUMED M9 Appointed WII Project Evaluations</b>  <i>Medical and Rehabilitative Care</i>	Combat Trauma Registry Expeditionary Medical Encounter Database (WII Project #89)	Provided analytic and consultation support to assist with quarterly reporting and analysis for WII projects. Consultations improved data quality and collection practices across all projects and the ability of Navy Medicine to assess project success and return on investment.
	U.S. Navy and Marine Corps Reserves Psychological Health Outreach Program (WII Project #90)	
	Returning Warrior Workshop (WII Project #91)	
	Naval Special Warfare Resilience Program (WII Project #93)	
	Case Management and Coordination for Wounded Warrior Regiment (WII Project #95)	
	Integrated Disability Evaluation System (WII Project #W100)	
	TBI Treatment and Cognitive Rehabilitation Program, NH Camp Lejeune (WII Project #172)	
	TBI and Related Disorders Mobile Assessment Unit (WII Project #178)	
<b>BUMED M9 Internal Metrics</b>  <i>Protection and Prevention</i>	Burden of War-related Amputations Among Navy and Marine Corps	Conducted statistical analyses and outcome assessments of WII 141 metrics and surveillance and screening domain-level metrics. Reported quarterly to inform ongoing initiatives and identify trends in injury and behavioral health.
	mTBI Incidence	
	Number of Marines Predicted to Return from Deployment	
	PTSD Burden by MTF, Active Duty Navy and Marine Corps	
	Predicting PTSD, TBI, and MDD in Marines Expected to Return from Deployment by Assigned MTF	
	Total Predicted Encounters in Assigned MTF	
	TBI in Garrison	
	Trends in TBI Prevalence	
<b>Amputations</b>  <i>Healthy and Fit Force</i>	<b>Amputation Line List for Wounded Warrior Regiment</b> Developed database registry of U.S. Marine Corps (USMC) traumatic amputation provided to Wounded Warrior regiment medical staff for the identification and confirmation of amputations within the USMC.	Provided an analysis and baseline for tracking war-related amputations to improve access to care and assess burden on the healthcare system.
	<b>Burden of War-Related Amputation among U.S. Navy and USMC</b> Provided retrospective assessment of war-related amputation and infections within the DON from 2001-2011.	

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Focus Area <i>Pillar</i>	Key Product	Returns/Outcomes
<b>Behavioral and Mental Health</b>  <i>Healthy and Fit Force</i>  <i>Protection and Prevention</i>	<b>7th Marines Division (MARDIV) Force Health Surveillance Report</b> Provided rates of behavioral health outcomes by unit for the 7th MARDIV including PTSD, depression, alcohol abuse, and suicide/homicide risk.	Conducted analytic reports of behavioral and mental health outcomes—including PTSD, MDD, TBI, and SUD—for multiple WII stakeholders. Enabled operational commanders and healthcare providers to make data-driven decisions on policies and practices that help treat and prevent deployment-related illnesses and injuries.
	<b>Alcohol Abuse/Disorder and Comorbid Conditions</b> Conducted an analysis to identify active duty USMC service members with alcohol abuse/disorder and comorbid behavioral health conditions throughout treatment; provided to the USMC Substance Abuse Program to evaluate and revise program.	
	<b>Alcohol and Substance Abuse Quarterly Incidence Report</b> Developed a report detailing alcohol and substance abuse among Navy and Marine Corps service members; provided to BUMED M9 and the Vice Chief of Naval Operations in response to increasing substance abuse.	
	<b>Comparison of Selected Behavioral Health Conditions, Injuries, and Communicable Diseases in Standard Ambulatory Data Record (SADR) and Comprehensive Ambulatory Professional Encounter Record (CAPER)</b> Provided ambulatory and inpatient analysis of select diseases and conditions to enhance case capturing.	
	<b>Descriptive Analysis of Sleep Disorders in Navy and Marine Corps Service Members</b> Assessed sleep disorders among Sailors and Marines from 2002-2012; distributed to BUMED and USMC medical leadership.	
	<b>DON Psychotropic Prescription Drug Use</b> Analyzed prescription patterns of psychotropic drugs in response to a major campaign to prevent suicides and reduce substance abuse.	
	<b>Force Health Surveillance Report, 1st Marine Logistics Group</b> Analyzed results from the I Marine Expeditionary Force (I MEF) Force Health Surveillance Report stratified by deployment status, gender, and occupation specialty per Major Subordinate Command. The results were used to target particular risk factors associated with the highest rates of behavioral health conditions.	
	<b>Prevalence of Behavioral Health Conditions, I MEF</b> Developed a report to detail prevalence of Marines who actively seek treatment for selected behavioral health conditions in I MEF as requested by I MEF Force Surgeon.	
	<b>PTSD and Psychotropic Medicine</b> Provided PTSD and psychotropic drug use rates for a brief to the Assistant Commandant of the Marine Corps.	
	<b>Returning Warrior Workshop and Psychosocial Health Pathways Tier III Review</b> Supplied medical encounter and deployment health assessment data for a BUMED review of programs assessing the effect of program participation on a variety of satisfaction and outcome measures, including psychological health and medical utilization.	

WII 141 PROJECT: EXPANDED SURVEILLANCE AND METRICS SUPPORT  
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Focus Area <i>Pillar</i>	Key Product	Returns/Outcomes
<b>Behavioral and Mental Health</b>  <i>Healthy and Fit Force</i>  <i>Protection and Prevention (continued)</i>	<b>Review of Mental Health Dispositions for DON Physical Examination Board (PEB)</b> Conducted an analysis for BUMED M9 of all DON personnel that received a separation or temporary retirement for disability determination at the PEB.	Conducted analytic reports of behavioral and mental health outcomes—including PTSD, MDD, TBI, and SUD—for multiple WII stakeholders. Enabled operational commanders and healthcare providers to make data-driven decisions on policies and practices that help treat and prevent deployment-related illnesses and injuries.
	<b>USMC Alcohol and MDD Demographic Report</b> Provided a report detailing demographic characteristics of service members with MDD or alcohol abuse encounters for CY2012. The report was used by USMC Operation Stress Control Program to aid in directing care and services allocation.	
	<b>USMC Explosive Ordinance Disposal (EOD) Health Surveillance Report</b> Developed three reports detailing MDD and alcohol use among EOD service members. The report was used by Combat Engineers to evaluate the EOD Decompression Program.	
<b>Medical Injuries Reports</b>  <i>Protection and Prevention</i>	<b>Annual Injury Reports</b> Provided annual injury reports at the Echelon 2 level for all Navy and Marine Corps active duty personnel. These reports generated numerous follow-up reports to focus on specific injuries or populations.	Supplied analytic data reports to evaluate prevention efforts, target injury prevention efforts, and to assess the extent and types of injuries experienced by service members and treated by Navy Medicine.
	<b>Agile Capabilities, Deployment Limited Conditions Metric</b> Provided metric analysis and quarterly updates of deployment limiting conditions, such as behavioral health conditions and orthopedic injuries in shipboard Navy service members.	
	<b>Annual Medical Event Report</b> Created a report identifying service members who were reported for any condition outlined in the Armed Forces Reportable Medical Event Guide.	
	<b>Hearing Loss and Tinnitus in Active Duty Marines, 2009-2012</b> Generated a report summarizing all USMC hearing loss cases, including audiometric testing.	
	<b>Foot and Ankle Crush Injuries among Marine Combat Engineers</b> Conducted an analysis of foot injuries at Camp Lejeune from 2011 to 2012.	
	<b>IDES Medical Evaluation Boards by Navy Medicine Region</b> Provided data on the number of service members who completed a MEB and the average completion time within IDES.	
	<b>Physical Readiness Information Management System (PRISM) Active Duty U.S. Navy Medical Waivers, 2010-2012</b> Developed a report analyzing the waivers of the physical readiness test for service members.	
	<b>U.S. Marine Corps Genital Injury Roster</b> Developed a report requested by the Wounded Warrior Regiment that identified cases of genital injuries for the case finding and burden confirmation of genital injuries in the USMC.	

WII 141 PROJECT: EXPANDED SURVEILLANCE AND METRICS SUPPORT  
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Focus Area <i>Pillar</i>	Key Product	Returns/Outcomes
<b>Suicide</b>  <i>Healthy and Fit Force</i>	<b>OPNAV N171 Suicide Case Review</b> Conducted an annual suicide case review and provided analytical support for OPNAV N171 for suicide data analysis; requested by BUMED.	Completed suicide analysis; used reports to identify risk factors and prevention approaches for suicide vulnerability and ideation among WII service members.
	<b>Navy Surgeon General Suicide Case Review</b> Reviewed suicide cases from January 2011 to October 2012 in collaboration with HA, HPW, and others to identify patterns, evaluate existing programs, determine potential intervention points, and assess data quality.	
	<b>Attempted Suicides in the U.S. Navy, Calendar Years 2010, 2011</b> Provided a proposal to the U.S. Navy on suicidal behaviors and suicides to improve knowledge of suicidal trends among Sailors and aid in the identification of treatment methods and intervention programs.	
<b>Traumatic Brain Injury</b>  <i>Protection and Prevention</i>	<b>Annual Surveillance of TBI</b> Developed a report to provide yearly incidence and prevalence trends of TBIs among active duty Navy and Marine Corps service members. The report provided detailed information on severity, follow-up care, and demographics.	Developed analytical surveillance reports used to assess TBI burden and incidence in service members.
	<b>Incidence and Prevalence of TBI in II MEF Marines</b> Generated a report that provided incidence and prevalence of TBI in II MEF for CY2012 by unit. The report was used by II MEF Force Surgeon.	
	<b>TBI Ambulatory/Inpatient Encounters at identified MTFs</b> Provided active duty and reserve hospitalization data to BUMED M96 in preparation for site validations at NMC Portsmouth, NH Camp Lejeune, and NMC San Diego; assisted in determining correct MTF category ratings.	





Photo by Lance Corporal Brendan Roethel

# WII 141A Project: Health Promotion and Wellness

WII service members frequently remain with their parent commands in non-WII focused environments where health or lifestyle behaviors may not be appropriately addressed and negatively impact healing, resilience, and recovery. The HPW Project develops products, services, and programs in support of force health readiness and resilience, offering unique solutions to meet the needs of the WII population no matter where they are located. HPW resources arm healthcare professionals with WII-tailored products and services to prevent illness and injury, hasten recovery, and promote healthy behaviors in a way that is relevant, appropriate, and timely for WII members. During FY2013, the HPW Department further developed and expanded programs and resources for WII members, their families, caregivers, and others who support and assist WII members during the recovery and transition process. The tables below outline these essential programs and resources to promote and sustain healthy lifestyle behaviors.

Focus Area Pillar	Key Product	Returns/Outcomes
<b>Case Management and Provider Resources</b>  <i>Healthy and Fit Force</i>	<b>Case Management Resources</b> Created nine fact sheets for case managers to utilize with WII patients in the constraints of limited time and knowledge on healthy lifestyle behaviors. <a href="http://www.med.navy.mil/sites/nmcphc/wounded-ill-and-injured/pages/case-management.aspx">www.med.navy.mil/sites/nmcphc/wounded-ill-and-injured/pages/case-management.aspx</a>	Analyzed the results of a previously conducted needs assessment with case managers to determine what services, tools, and educational resources are most supportive to help them address the health behavior needs of the WII population. Since the update and development of new resources, the case manager webpage is consistently one of the most viewed WII pages each month and the fourth most viewed WII page for FY2013.
	<b>WII Resources listed in National Resource Directory (NRD)</b> Added six NMCPHC WII resources to the NRD to decrease redundancy and overlap in information as well as enhance NRD as a tool for Navy case managers. <a href="http://www.nrd.gov/health/healthy_living/wellness_and_fitness">www.nrd.gov/health/healthy_living/wellness_and_fitness</a>	

## WII 141A PROJECT: HEALTH PROMOTION AND WELLNESS

Focus Area <i>Pillar</i>	Key Product	Returns/Outcomes
<b>Strategic Outreach to WII Stakeholders</b>  <i>Healthy and Fit Force</i>	<b>Fleet Outreach</b> Presented information on the HPW campaign, including tailored WII products and services, during HPW Awareness Days to educate Sailors and Marines on health behaviors and increase awareness of HPW materials. This included 10 ships and shore-based commands, reaching approximately 1,426 Sailors and Marines.	Increased awareness of WII products, materials, and services. Provided the latest information and resources virtually to Navy and Marine Corps personnel worldwide on a variety of topics to help address the needs of the wounded, ill, or injured.
	<b>Navy HPW Course: Impact of Health Behaviors on Recovery and Resilience for WII Service Members</b> Conducted 3-day training courses that address the effects of health behaviors on the recovery of WII Sailors and Marines to increase awareness among health promotion staff and improve their ability to serve the needs of the WII population. Key topics included healthy eating, active living, tobacco free living, relationship issues, psychological and emotional well-being, injury and violence free living, and preventing drug abuse and excessive alcohol use as well as the impact of health behaviors on TBI, PTSD, and amputations.	
	<b>WII Virtual Town Hall: Addressing the Needs of the WII Population</b> Conducted a webinar to provide resources available from various entities to include HPW, Navy Wounded Warrior-Safe Harbor, and Wounded Warrior Battalion East that meet the needs of the WII population and their caregivers and family members. <a href="http://www.med.navy.mil/sites/nmcphc/health-promotion/pages/webinars.aspx">www.med.navy.mil/sites/nmcphc/health-promotion/pages/webinars.aspx</a>	
	<b>Road to Recovery - Healthy Living Recommendations to Incorporate into Your Recovery Plans</b> Conducted a webinar to communicate information, importance, and relationship of nutrition, physical activity, and tobacco use/cessation on injury, illness, and recovery. <a href="http://www.med.navy.mil/sites/nmcphc/health-promotion/pages/webinars.aspx">www.med.navy.mil/sites/nmcphc/health-promotion/pages/webinars.aspx</a>	
	<b>Navigating the Stages of Change</b> Conducted a webinar to describe the decision making process, how individuals move through behavior change, and practical applications of the Stages of Change Model to health behaviors. <a href="http://www.med.navy.mil/sites/nmcphc/health-promotion/pages/webinars.aspx">www.med.navy.mil/sites/nmcphc/health-promotion/pages/webinars.aspx</a>	
<b>Amputation</b>  <i>Medical and Rehabilitative Care</i>	<b>HPW Resources to Assist WII Sailors and Marines with Traumatic Amputations</b> Generated a report identifying HPW resources for use during the early phase of treatment and rehabilitation of WII service members; collaborated with EDC to analyze diagnoses of comorbid conditions experienced within the amputee population and consulted with Naval Health Research Center subject matter expert to review the report and establish a collaborative partnership. <a href="http://www.med.navy.mil/sites/nmcphc/documents/wounded-ill-injured/HPW-resources-to-assist-WII.pdf">www.med.navy.mil/sites/nmcphc/documents/wounded-ill-injured/HPW-resources-to-assist-WII.pdf</a>	Promoted resources to address the underlying determinants of health that are necessary to promote a more rapid and successful recovery during the short-term phase of rehabilitation for amputees and aid in preventing complications associated with chronic illnesses among this population.
	<b>“Life After An Amputation” Webpage</b> Developed a webpage to provide resources on physical activity, assistive technology, nutrition, healthy living, veterans services, recreation and adaptive sports, and emotional well-being. <a href="http://www.med.navy.mil/sites/nmcphc/wounded-ill-and-injured/pages/amputee.aspx">www.med.navy.mil/sites/nmcphc/wounded-ill-and-injured/pages/amputee.aspx</a>	

Focus Area <i>Pillar</i>	Key Product	Returns/Outcomes
<b>Behavioral and Mental Health</b>  <i>Healthy and Fit Force</i>	<b>Relax, Relax Toolkit</b> Created a website with music, information, and resources to provide relaxation techniques, coping strategies, and stress relief. The toolkit website had over 300 page views in the first 2 weeks of the tool's release in August 2013 and 429 page views in October 2013. <a href="http://www.med.navy.mil/sites/nmcphc/health-promotion/psychological-emotional-wellbeing/relax-relax/pages/index.html">www.med.navy.mil/sites/nmcphc/health-promotion/psychological-emotional-wellbeing/relax-relax/pages/index.html</a>	Developed and refined resources to assist in addressing distress-related behaviors, suicide prevention, and aid in resiliency building and mission readiness. These products build on one of HPW's core functions, psychological and emotional well-being, to address a variety of populations, needs, and topics under this broader initiative.
	<b>Suicide Prevention Webpage and Resources</b> Updated and refined webpage to increase user friendliness for a variety of audiences. Developed targeted products with new messaging to represent different communities in the Fleet. <a href="http://www.med.navy.mil/sites/nmcphc/health-promotion/psychological-emotional-wellbeing/pages/suicide-prevention.aspx">www.med.navy.mil/sites/nmcphc/health-promotion/psychological-emotional-wellbeing/pages/suicide-prevention.aspx</a>	
	<b>OPNAV N171 Suicide Case Review</b> Contributed to OPNAV N171 2011 suicide case review in identifying patterns, evaluating existing programs, and determining potential points of intervention to reduce suicide.	
	<b>Navy Surgeon General Suicide Case Review</b> Reviewed suicide cases from January 2011 to October 2012 in collaboration with EDC, HA, and others to identify patterns, evaluate existing programs, determine potential intervention points, and assess data quality.	
	<b>Defense Centers of Excellence Virtual Mental Health Fair</b> Participated in Facebook-based Virtual Mental Health Fair by hosting a booth and providing staff to answer questions and disseminate resources to interested target audiences such as Sailors, Marines, health educators, and mental health professionals.	
	<b>Navy Leader's Guide for Managing Sailors in Distress Mobile Application</b> Developed a mobile application edition of the online Navy Leader's Guide handbook, in collaboration with National Center for Telehealth and Technology (T2), to help leaders recognize distress-related behaviors, provide support, and collaborate with Navy helping agencies. The WII population can exhibit these distress-related behaviors including stress, alcohol and/or drug misuse, interpersonal relationship issues, and suicide prevention. <a href="http://www.med.navy.mil/sites/nmcphc/documents/lguide/index.aspx">www.med.navy.mil/sites/nmcphc/documents/lguide/index.aspx</a>	
	<b>NMCPHC Psychological and Emotional Well-Being Webpage</b> Updated multiple webpages to reflect new topics and enhance the delivery of resources that focus on increased resiliency. <a href="http://www.med.navy.mil/sites/nmcphc/health-promotion/psychological-emotional-wellbeing/pages/psychological-emotional-wellbeing.aspx">www.med.navy.mil/sites/nmcphc/health-promotion/psychological-emotional-wellbeing/pages/psychological-emotional-wellbeing.aspx</a>	
	<b>Navy Suicide Prevention General Military Training</b> Coordinated with staff at Center for Personal and Professional Development to provide resilience and suicide prevention resources for general military training.	

## WII 141A PROJECT: HEALTH PROMOTION AND WELLNESS

Focus Area <i>Pillar</i>	Key Product	Returns/Outcomes
Sleep Health  <i>Healthy and Fit Force</i>	<b>Sleep Disorders Cross-Sectional Analysis Report</b> Created a report on the prevalence of sleep disorders and related comorbidities within the active duty and reserve communities, many of whom are wounded, ill, or injured. Distributed to 784 medical professionals at various MTFs, Wounded Warrior Battalions, Medical Transition Units, Marine Corps Community Services, and Navy Wounded Warrior-Safe Harbor. <a href="http://www.med.navy.mil/sites/nmcphc/documents/health-promotion-wellness/psychological-emotional-wellbeing/sleep-article.pdf">www.med.navy.mil/sites/nmcphc/documents/health-promotion-wellness/psychological-emotional-wellbeing/sleep-article.pdf</a>	Promoted educational products to raise awareness about positive behavior changes that can mitigate sleep disturbances.
	<b>Got Sleep?</b> Developed a webinar to discuss the importance of and misconceptions about sleep; the signs, symptoms and effects of poor sleep; types of sleeping disorders and issues; and helpful strategies for a good night's sleep. <a href="http://www.med.navy.mil/sites/nmcphc/documents/health-promotion-wellness/general-tools-and-programs/webinars/got-sleep-webinar.pdf">www.med.navy.mil/sites/nmcphc/documents/health-promotion-wellness/general-tools-and-programs/webinars/got-sleep-webinar.pdf</a>	
Substance Use  <i>Healthy and Fit Force</i>  <i>Prevention and Protection</i>	<b>Alcohol Abuse and Drug Misuse Programs</b> Updated a fact sheet with strategies to increase awareness of educational and training programs and intervention resources for alcohol abuse and drug misuse. <a href="http://www.med.navy.mil/sites/nmcphc/documents/health-promotion-wellness/preventing-drug-alcohol-abuse/alcohol-abuse-drug-misuse-programs-march-2013.pdf">www.med.navy.mil/sites/nmcphc/documents/health-promotion-wellness/preventing-drug-alcohol-abuse/alcohol-abuse-drug-misuse-programs-march-2013.pdf</a>	Developed educational materials and resources to enhance prevention efforts and help WII service members understand the ramifications of unhealthy use of alcohol and/or prescription drugs as a coping mechanism or to relieve stress. Enabled tobacco cessation at the deck plate by providing tobacco cessation facilitator training for over 75 new facilitators on the types of tobacco use and the negative effects on health, stress, wound healing, and well-being.
	<b>Tobacco Cessation Facilitator Training</b> Conducted nine tobacco cessation facilitator trainings with participants from the fleet, dental, medical, and reserve commands. Deck plate tobacco cessation increases accessibility for Sailors and Marines in a variety of locations, including WII service members, while saving time and productivity, and increasing access to care.	
	<b>Great American Smokeout (Nov 12)</b> Collaborated with various Navy Medicine entities to promote tobacco cessation at NMC Portsmouth for Sailors, Marines, and other beneficiaries through various platforms such as social media, a blog, and an article.	





Photo by Mass Communication Specialist Seaman Veronica Mammina

## WII 141B Project: Health Hazard Assessment

The HHA Project analyzes occupational and environmental health surveillance data to conduct technically sound and scientifically defensible health hazard assessments. These assessments report to leadership the potential acute and chronic health risks associated with military deployments. The project also increases FDPMU readiness through the refinement of FDPMU field sampling protocols. These protocols allow the deployable teams to assist commanders in minimizing environmental exposures through the timely implementation of controls and provide recommendations for risk-based decisions about environmental exposures. The services and products outlined in the tables below directly support the development of Navy preventive medicine programs that identify, evaluate, monitor, respond to, and decrease the likelihood of experiencing diseases, injuries, and environmental factors that threaten human health.

Focus Area <i>Pillar</i>	Key Product	Returns/Outcomes
POEMS  <i>Protection and Prevention</i>	<b>Camp Lemonnier POEMS</b> Developed a report to evaluate the health risks associated with environmental stressors experienced by deployed personnel at Camp Lemonnier.	Built upon the foundation established by last year's POEMS; refined the skill sets and analytical processes to evaluate environmental data collected from site assessments, environmental samples, and healthcare encounters. POEMS assessed the significance of both short-term and long-term health risks for populations deployed to specific sites and improve population health surveillance. POEMS can be used to provide defensible, definitive assessments of deployment-related environmental exposures to medical practitioners, service members, and other stakeholders, as well as other services in the U.S. military.
	<b>Camp Fallujah POEMS</b> Developed a report to evaluate the health risks associated with chemical, biological, and physical stressors faced by deployed personnel at Camp Fallujah.	

## WII 141B PROJECT: HEALTH HAZARD ASSESSMENT

Focus Area <i>Pillar</i>	Key Product	Returns/Outcomes
<b>POEMS</b>  <i>Protection and Prevention (continued)</i>	<b>Al Asad Air Base POEMS</b> Developed a report to evaluate the health risks associated with chemical, biological, and physical stressors faced by deployed personnel at Al Asad Air Base.	Built upon the foundation established by last year's POEMS; refined the skill sets and analytical processes to evaluate environmental data collected from site assessments, environmental samples, and healthcare encounters. POEMS assessed the significance of both short-term and long-term health risks for populations deployed to specific sites and improve population health surveillance. POEMS can be used to provide defensible, definitive assessments of deployment-related environmental exposures to medical practitioners, service members, and other stakeholders, as well as other services in the U.S. military.
	<b>Camp Leatherneck/Camp Dwyer POEMS</b> Developed a report to evaluate and characterize health risks at the population level for deployed personnel at Camp Leatherneck-Bastion and Camp Dwyer.	
<b>Field-Portable Analytical Equipment Calibration</b>  <i>Protection and Prevention</i>	<b>HAPSITE ER Gas Chromatography-Mass Spectrometry (GC-MS) Calibration</b> Calibrated GC-MS to validate permeation system for testing and optimization.	Calibration is necessary to complete exposure assessments in the deployed environment that support real-time operational risk management assessments. The calibration helps to identify, avoid, and document personnel exposures to environmental health stressors in the deployed area.
<b>Proficiency Analytical Testing (PAT)</b>  <i>Protection and Prevention</i>	<b>Proficiency Analytical Testing</b> Completed 16 rounds of training last year (4 each quarter) and resulted in a "Satisfactory" rating for the command and participants, including personnel from Navy and Environmental Preventive Medicine Units 2, 5, and 6. The PAT round project is ongoing.	The PAT round project certifies analytically proficient healthcare scientists to identify, assess, and control personnel exposures to environmental health stressors in the expeditionary environment. The PAT training ensures FDPUMs are capable to deploy modern field-portable analytical equipment proficiently in different areas.



Photo by Lance Corporal Bruno Bego

## WII 141C Project: Navy Entomology Center of Excellence

Blood-feeding insects and the diseases they carry pose serious risks to the nation's warriors around the globe. Control programs aimed at decreasing insect populations and providing personal protective equipment play a key role in guarding deployed warfighters from insects that transmit life-threatening diseases. NECE provides expertise for the ongoing development of new and improved insecticides, application equipment and techniques, and surveillance methods and is the world's sole military-specific entomological research center. The NECE WII Project continues to make significant advancements, enhancing the health and operational readiness of service members by constantly delivering innovative approaches for developing new chemicals, technology, and techniques that improve the safety and effectiveness of programs that control blood-feeding insects. In recognition of their collaborative partnerships, the Navy Surgeon General complimented NECE as "a great example of jointness in research and development." The tables below outline these achievements in safeguarding warfighters and at-risk populations.

*"The work conducted at the Navy Entomology Center of Excellence is a great example of jointness in research and development. NECE partnered with scientists and public health professionals from the Army, Air Force, as well as the World Health Organization, USDA and other federal agencies to develop new insecticides, techniques and application technologies to control blood-feeding insects that transmit human disease that threaten the warfighter on the battlefield, such as malaria and dengue."*

– Vice Admiral Matthew L. Nathan, U.S. Navy Surgeon General, and Chief, U.S. Navy Bureau of Medicine and Surgery



## WII 141C PROJECT: NAVY ENTOMOLOGY CENTER OF EXCELLENCE

Focus Area <i>Pillar</i>	Key Product	Returns/Outcomes
<b>Testing and Evaluation</b>  <i>Protection and Prevention</i>	<b>Recognition as a WHO CC for Testing and Evaluation of Insecticide Application Equipment</b> Phase I: NECE made great strides in becoming recognized by the WHO as a Collaborating Centre for the testing and evaluation of pesticide dispersal technology. Attaining this status will result in the following: (1) NECE serving as the only international center of excellence for how public health insecticides are applied—equally important as which insecticide is applied. NECE already earned that distinction for the DOD while also serving as the field testing nucleus of a highly successful consortium of U.S. federal labs, academe, and industry all with overlapping motives to discover new products to better protect deployed warfighters and global citizens from insects that transmit diseases; (2) recruitment for more collaborative research efforts from new national and international federal labs, universities, and industries which will result in additional and improved products to protect deployed warfighters from insects that transmit diseases; and (3) the development of new collaborative initiatives that help promote global health, a key national security priority for the DOD and Navy.	Developed new technology to apply existing and novel insecticides and formulations thereby increasing the effectiveness of insect control programs, which resulted in a significant reduction of disease risk on the battlefield. Many NECE projects currently align with DOD's focus on controlling disease-transmitting, blood-feeding insects in the United States Pacific Command Area of Responsibility. Evaluation of the technology and insecticides in an operational setting allows NECE to adapt insect control programs to ensure maximum effectiveness in protecting deployed warfighters. Evaluation results also provide manufacturers with criteria and a way for products and technology to be approved by the AFPMB for use by all services. This results in the standardization of equipment and application techniques based on the best possible technology.
	<b>Establishment of a Permanent NECE Facility at the Camp Blanding Joint Training Center, Starke, Florida</b> Complete: NECE successfully leveraged numerous collaborative relationships with academia, industry, governmental, and non-governmental agencies to develop novel products and techniques reducing the risk of human disease carried by blood-feeding insects on the battlefield. Each breakthrough is evaluated in a field setting to ensure effectiveness and adherence to DOD requirements. This year, NECE and the Florida Army National Guard (FLANG) strengthened an already productive and ongoing relationship by establishing a permanent field-testing facility at the FLANG Camp Blanding Joint Training Center. NECE and FLANG optimized opportunities to evaluate novel vector control chemicals, equipment, and techniques that directly contribute to warfighter protection and exemplify the effectiveness of joint cooperation that characterizes the operational environment today.	
	<b>Development of Portable Sprayer to Generate a Cloud of Small Insecticide Droplets (5 Microns) Using Sound Vibrating Technology</b> Phase II: Developed portable, electrostatic equipment for residual insecticide applications to control blood-feeding insects resulting in three patents created by NECE. This equipment will play a key role in testing the validity of using electrostatics during insecticide applications to improve mosquito control.	
	<b>Center for Disease Control (CDC) Project Evaluating Residual Insecticides Against Mosquitoes on Various Surfaces (Wood, Manure/Mud Coated Panels)</b> Phase I: Examined the efficacy of indoor application of a residual insecticide (Indoor Residual Spray) to control malaria-carrying mosquitoes in Africa. Results from this study will provide information useful for executing successful malaria control programs as part of the President's Malaria Initiative and guide design and implementation of insect-borne disease control programs during DOD contingency/humanitarian assistance operations worldwide.	



Focus Area <i>Pillar</i>	Key Product	Returns/Outcomes
<b>Testing and Evaluation</b>  <i>Protection and Prevention (continued)</i>	<b>Evaluation of Micro-Encapsulated Deltamethrin as a Residual Treatment to Control Mosquitoes</b> Phase I: Conducted field evaluation of novel deltamethrin (pyrethroid class of insecticide) formulation to treat Hercules Engineering Solutions Consortium (HESCO) barriers and use as indoor residual spray (particularly on building material commonly used during deployments such as plywood) to target disease carrying mosquitoes and sand flies. Sand flies transmit leishmaniasis and breed in the artificial habitats created by HESCO barriers, which are widely used for security purposes during contingency operations. Control programs require application of an effective/long lasting insecticide and initial results indicate that the insecticide performed well.	Developed new technology to apply existing and novel insecticides and formulations thereby increasing the effectiveness of insect control programs,
	<b>Indoor Control of the Dengue Vector, <i>Aedes aegypti</i>, Using Thermal Fog, and Ultra-Low Volume Technologies</b> Phase II: Evaluated the efficacy of applying a pyrethroid insecticide, deltamethrin, using thermal fog application (an unique application technique) in homes to reduce <i>Aedes aegypti</i> populations, thereby lowering the risk of dengue fever impacting DOD personnel in surrounding areas. NECE proved this technique is effective and recommended the equipment and insecticide be issued NSNs to make them available to personnel supporting deployed warfighters.	which resulted in a significant reduction of disease risk on the battlefield. Many NECE projects currently align with DOD's focus on controlling disease-transmitting,
	<b>Assessment of Compounds from the U.S. Department of Agriculture, Agricultural Research Service Chemical Archives for Insecticidal Activity</b> Phase II: Conducted toxicological screening on adult and larval mosquitoes using compounds submitted by several sources including Vestergaard Frandsen, Marrone Bio Innovations, Chemtura, BASF, and Bayer. The screening resulted in improvements to existing products and the discovery of additional public health uses of compounds currently used for agricultural purposes. This increased the effectiveness of control programs, particularly of insects resistant to pesticides already in use.	blood-feeding insects in the United States Pacific Command Area of Responsibility. Evaluation of the technology and insecticides in an operational setting
	<b>Pesticide Application Equipment Annual Evaluation 2013</b> Serving as DOD's testing and evaluation center for insecticide application equipment, NECE hosted an annual weeklong symposium for manufacturers of insecticide dispersal equipment to demonstrate new products and technology allowing assessment against military-specific requirements. After testing, manufacturers were debriefed, providing opportunity for discussion on evaluation results, potential modifications, and future technology.	allows NECE to adapt insect control programs to ensure maximum effectiveness in protecting deployed warfighters. Evaluation results also provide
	<b>Evaluation of an Intelligent Sprayer for Vegetative Barrier Applications</b> Phase I: Collaborated with the U.S. Department of Agriculture, Agricultural Research Service, Application Technology Research Unit in Wooster, Ohio to develop "intelligent pesticide application sprayer" technology that senses vegetation (typical resting and breeding habitat for most nuisance and blood-feeding insects that carry human disease) and automatically sprays the area, reducing the number of applications and amount of pesticide needed for control.	manufacturers with criteria and a way for products and technology to be approved by the AFPMB for use by all services. This results
	<b>Small Carbon Dioxide (CO2) Generators for Use with CDC Light Traps Evaluation</b> Phase II: Evaluated the durability, usability, and efficacy of two field CO2 generators produced from the Small Business Innovation Research Program. NECE staff made recommendations for improvement to the manufacturers and will provide a follow-up evaluation. Increasing CO2 availability in deployed settings will enhance insect surveillance efforts, which is critical in assessing disease risk and designing and evaluating control programs.	in the standardization of equipment and application techniques based on the best possible technology.

## WII 141C PROJECT: NAVY ENTOMOLOGY CENTER OF EXCELLENCE

Focus Area <i>Pillar</i>	Key Product	Returns/Outcomes
<b>Novel Control Techniques</b>  <i>Protection and Prevention</i>	<b>Two Patents for Technology Based On Previously Unknown Information that Flying Mosquitoes Produce a Static Electric Charge</b> Phase I: NECE discovered that flying mosquitoes produce a static electric charge. From this discovery, a novel patent-pending sprayer is being developed that will produce a cloud of insecticide droplets, with the opposite static charge, that seek out and kill these flying mosquitoes. This sprayer will result in a significant enhancement of mosquito control programs and will increase the effectiveness of targeting, resulting in mortality of the flying mosquito thereby reducing the global impact of human disease, to include malaria and dengue fever.	Improved pesticide application methodologies and formulations ensure personnel that support warfighters have the latest and most effective tools available.
	<b>Evaluation of Novel Pesticides and Formulations for Efficacy Against Medically Important Mosquitoes</b> Phase I: Evaluated the efficacy of the insecticide tolfenpyrad against adult mosquitoes in collaboration with Nichino America, a subsidiary of Nihon Nohyaku Co (Japan's first and oldest agrochemical manufacturing company). This contact insecticide is characterized by a unique mode of action, Mitochondrial Electron Transport inhibition, and short residual activity. Mitochondrial Electron Transport Inhibition could be used to control pyrethroid resistant mosquito populations. Based on initial results this insecticide showed promise against insects of public health importance and could be added to the DOD-approved list contributing to the protection the deployed warfighter.	
	<b>Evaluation of Ribonucleic Acid Interference (RNAi) to Control Disease Vector Mosquitoes</b> Phase II: Evaluated the effectiveness of RNAi constructs targeting specific genes that make mosquitoes resistant to pesticides without affecting non-targets and causing resistance or species-specific effects. If these resistance genes are knocked down, the mosquito should become susceptible to the pesticide, which makes an already approved pesticide more useful and extends its effective period of use.	
	<b>Development of a Multi-functional, Lightweight, Durable, Powered by Compressed Air Backpack Sprayer to Address a Capability Shortfall Applying Residual Insecticides to a Variety of Substrates</b> Completed: Collaborated with Dorendorf Advanced Technologies to produce the JQSX backpack sprayer. Recommended by the AFPMB's Equipment Committee and approved by the AFPMB Council, a NSN was assigned and the JQSX sprayer is now listed on the approved equipment list and in use by the Navy's FDPUMs.	
	<b>Investigation into Insect-Droplet Interactions Using High Speed Cameras and Ultra Low Volume Droplets</b> Phase I: Examined the dynamics of insecticide droplet-mosquito interaction using high-speed photography to gather valuable data. This information guides the modification of insecticide formulations and delivery systems to maximize insect mortality while using a minimal amount of chemical product.	



Photo by Mass Communications Specialist 3rd Class Daniel A Barker

## The Mission Ahead for NMCPHC

The public health analyses, reports, and resources created by the NMCPHC WII Program advance the ability of decision makers and care providers to improve the health of WII service members. The command's products and services contribute across the spectrum of readiness, resilience, and recovery and support each pillar of Force Health Protection. Public health experts collaborate within NMCPHC and partner with organizations throughout the DHA to promote FHP. These teams of scientists, epidemiologists, statisticians, programmers, and health educators conducted extensive research and analysis and developed unique products over the past several years. Plans for FY2014 capitalize on these resources to further establish targeted prevention, monitoring, and recovery strategies and effect long-term population health improvements.

Past successes of the NMCPHC WII 141 and 141A teams resulted in a project request from the Office of the Secretary of the Navy to assess the state of prescription drug use and abuse problems in the Navy and Marine Corps. This is an important topic for the WII population as combat exposure correlates with both proper use and misuse of prescription drugs. The project fosters collaboration across the command's clinical health analysis and health promotion capabilities, expands current support of operational force readiness, and contributes to substance use policy development. The report will be delivered to the Department of the Navy, Manpower and Reserve Affairs,

and will include recommendations for monitoring and reducing prescription drug abuse to support troop deployment and retention.

All NMCPHC future analysis, services, and products will strive to advance FHP and impact cultural changes for health and wellness within the DHA. The NMCPHC WII Program will continue expanded efforts to promote healthy lifestyle choices to maintain **a healthy and fit force**; conduct health surveillance, health hazard assessment, and insect control programs to enhance **prevention** of injuries and illness and **protect** the force from health hazards; and assess **medical and rehabilitative care** to sustain world-class healthcare for WII Sailors and Marines. As doctrine and military operational tempo change, FHP and medical care will evolve and NMCPHC is committed to providing relevant, cutting-edge support to Navy Medicine. With an uncertain future demand on U.S. military forces, individuals will need support to maintain readiness, enhance resiliency, and expedite recovery. Given continued funding for the NMCPHC WII Program, the four project teams will collectively and individually continue to strengthen FHP and operational mission accomplishments, improve health outcomes, and reduce healthcare expenses. As the program matures, the WII projects will demonstrate the full return on investment of its products and services through the reduced prevalence of illness and injury and speedy recovery in WII service members.

## THE MISSION AHEAD FOR NMCPHC

The Expanded Surveillance and Metrics Support Project Team will improve epidemiological surveillance with the addition of in-theater data on blast exposure and concussion incidence to monitor the health status of U.S. troops. The team will examine all available healthcare data and derive more sophisticated analysis throughout the entire deployment cycle to measure the impact of WII programs and services. Clinical resource utilization will be further scrutinized to ensure optimal use for the WII population.

The HPW Project Team will deploy the WII HRA to WII Sailors and Marines and the information will be analyzed to determine which behaviors are positively and negatively affecting resilience and recovery. The team will implement a partnership program to enhance collaboration with other WII-focused organizations and extend the reach of HPW key messages, resources, tools, and programs to motivate healthy living habits. The HPW Project Team will deploy a comprehensive evaluation of these programs to monitor and improve their effectiveness.

During the next year, the HHA Team will capitalize on the baseline established by subsequent POEMS to accelerate the evaluation of environmental data collected from site assessments, environmental samples, and healthcare encounters. GC-MS calibration, PAT, and quarterly training will continue to prepare field scientists with the skills needed to provide operational and tactical commanders timely analytical risk assessments. The NECE WII Project will provide cutting-edge entomological technology and methodology that support the readiness of warriors. The advances in entomology made possible by the WII project will protect human life from blood-feeding insects that carry human disease, yielding a lasting, positive impact on warfighters and military communities.

The products and services provided by the NMCPHC WII Program will remain critical to the state of readiness, resiliency, and recovery of the WII population. These projects are now integrated into the mission operations of BUMED and NMCPHC. With the current state of financial instability in the federal government, resources allocated to the NMCPHC WII Program may be decreased leading to a reduction in billets, and consequently, capability. NMCPHC remains dedicated to providing protection through prevention and hopes that the value of the WII projects are realized and codified within personnel and fiscal allotments for the command.



**Captain Philip Blaine**  
**Executive Officer, NMCPHC**

"NMCPHC remains dedicated to producing data-driven strategies and methods to prevent illness and improve the physical and behavioral health of our WII service members and committed to enhancing the readiness, effectiveness, and resilience of all Sailors and Marines. The public health analyses, reports, and resources created by the NMCPHC WII Program advance the ability of decision makers and care providers to support the WII population. The future of the NMCPHC WII Program is focused on expanding current products and services and developing new ones that strengthen Force Health Protection, improve health outcomes, and reduce healthcare expenses."



**Master Chief Derek Petrin**  
**Command Master Chief, NMCPHC**

"Our subject matter experts continue to set the standard by providing relevant, innovative programs and services to support our wounded, ill, and injured warriors and those who care for them. The key role that NMCPHC serves for the Navy Medicine WII programs epitomizes our passion to focus on the preservation of the fighting force and their families."



## Appendix A: References

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## Appendix B: Contact Information - NMCPHC WII Program

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## Appendix C: Acronym List

Acronym	Definition
AFPMB	Armed Forces Pest Management Board
ATC	Access to Care
BUMED	Bureau of Medicine and Surgery
CDC	Center for Disease Control
CO2	Carbon Dioxide
CY	Calendar Year
DHA	Defense Health Agency
DOD	Department of Defense
DON	Department of the Navy
ED	Emergency Department
EDC	EpiData Center
EOD	Explosive Ordnance Disposal
FDPMU	Forward Deployable Preventive Medicine Unit
FY	Fiscal Year
GC-MS	Gas Chromatography-Mass Spectrometry
GTMO	Guantanamo Bay
HA	Health Analysis
HESCO	Hercules Engineering Solutions Consortium
HHA	Health Hazard Assessment
HPW	Health Promotion and Wellness
HRA	Health Risk Assessment
IDES	Integrated Disability Evaluation System
M3	BUMED Medical Operations Code
M9	BUMED Wound, Ill, and Injured Code
MARDIV	Marine Division
MDD	Major Depressive Disorder
MEB	Medical Evaluation Board
MEF	Marine Expeditionary Force
MHP	Medical Home Port
mTBI	Mild Traumatic Brain Injury
MTF	Military Treatment Facility
NAV MED	Navy Medicine
NDAA	National Defense Authorization Act
NECC	Navy Expeditionary Combat Command
NECE	Navy Entomology Center of Excellence

Acronym	Definition
NH	Naval Hospital
NMC	Naval Medical Center
NMCPHC	Navy and Marine Corps Public Health Center
NRD	National Resource Directory
NSN	National Stock Numbers
OPNAV	Office of the Chief of Naval Operations
PDHRA	Post-Deployment Health Reassessment
PEB	Physical Examination Board
POEMS	Periodic Occupational and Environmental Monitoring Summary
PTSD	Post-Traumatic Stress Disorder
QOC	Quality of Care
RESPECT-Mil	Re-Engineering Systems of Primary Care Treatment in the Military
RNAi	Ribonucleic Acid Interference
SUD	Substance Use Disorder
TBI	Traumatic Brain Injury
TMA	TRICARE Management Activity
TOC	Transition of Care
U.S.	United States
USFF	U.S. Fleet Forces Command
USMC	United States Marine Corps
WII	Wounded, Ill, and Injured
WHO	World Health Organization
WHO CC	World Health Organization Collaborating Centre



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**Wounded, Ill, and Injured Project  
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Published: March 31, 2014



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